Rain-fed cultures on upper hillside, irrigated vegetable gardens on lower hillside, and irrigated rice fields at the bottom, representing acculturation over generations. Highlands of Madagascar. Photo by Ursula Gämperli

Soil and land in the Millennium Ecosystem Assessment and the Rio Conventions

Markus Giger

Introduction

An overview – based on material available on the relevant Internet sites – was undertaken in preparation for the Eurosoil Congress. The aim was to prepare the ground for the subsequent panel discussion on new mechanisms to support sustainable land management. The overview focused on the following basic question: How are soil and land issues addressed in the Millennium Ecosystem Assessment and in three important UN-Conventions (UNCCD; UNFCCC; UNCBD)?
The basic features of these important international processes and mechanisms and their relevance for soil and land issues were explored. Specifically, the following points were addressed:

- In what terms and with which concepts do these mechanisms address soil and land issues?
- What potential do they have to advance sustainable land management (SLM) based on inputs from science? What deficiencies, if any, can be observed?
- What efforts are currently being made to improve the synergies between these mechanisms?

Millennium Ecosystem Assessment

The Millennium Ecosystem Assessment (MA) is an international work program designed to meet the needs of decision-makers and the public for scientific information concerning the consequences of ecosystem change. The direct objectives of the MA are:

1. Systemisation of the existing assessments (conditions and trends),
2. Demonstration of the potential of ecosystems for poverty reduction, and
3. Evaluation of response options.

The MA is expected to meet the assessment needs of CBD, UNCCD, the Convention on Wetlands (Ramsar) and the Convention on Migratory Species (CMS).

Land issues are addressed through an ecosystem approach (dryland, forest, and mountain systems, inland waters, coastal and marine systems). The MA does not focus on soil or land per se, but its concept looks at the status and trends of ecosystem services. Conversely, land management, depending on the definition used, is indeed covered to some extent, through assessment of different ecosystems and their services.

Soils are therefore addressed in relation to the services they provide for human well-being and poverty reduction. In summary, the MA reports that more than 60% of ecosystem services have been degraded or used unsustainably (MA, 2005). The MA distinguishes among provisioning, regulating, cultural, and supporting services. Services related to soils therefore fall into all of these categories. The MA concludes that many provisioning services (e.g., food, livestock and fibre production) have increased tremendously over the last fifty years, which has helped to improve the lives of billions of people. However, many regulating and supporting functions have been degraded, and this is endangering the achievements of the Millennium Development Goals. The MA clearly advocates the need for far-reaching responses from decision-makers if the degradation of these ecosystem services is to be reversed.
Concretely, soil issues are taken up mainly in relation to the assessment of nutrient cycles, soil formation, erosion regulation, water regulation, and natural hazard regulation. However, compared to other questions such as biodiversity, soil issues are not dealt with very prominently in the report, and it is not expected that very significant new knowledge will be made available with regard to the status of soil resources.

United Nations Framework Convention on Climate Change

Land and soil issues are addressed in the UNFCCC, albeit predominantly indirectly in terms of objectives related to forestry and agriculture. In Article 4, all parties commit themselves (inter alia) to reducing and preventing greenhouse gases in all relevant sectors, including agriculture and forestry; to promote and cooperate in the conservation and enhancement of sinks and reservoirs in terrestrial systems; to prepare for adaptation to the impacts of climate change; to develop integrated plans for water resources and agriculture; and to protect and rehabilitate areas, particularly in Africa, affected by drought and desertification as well as floods.

The Kyoto Protocol foresees a relevant instrument, the Clean Development Mechanism. Concrete links to land use questions can be found, in particular to forest, cropland, and grazing land management, and revegetation. Presently the emphasis is mainly on forestry. However, the sustainability of a solution that relies on forests remains questionable, given the limited time horizon of carbon storage in forests. There is room to include carbon sequestration in soils in activities under the convention. Examples are reduced methane (CH_4) emission through improved manure management, different diets for livestock, adapted irrigation of rice, and lower laughing gas (N_2O) emissions from reduced use of chemical fertilisers. However, many procedures and methodologies in the Kyoto Protocol related to these issues have not yet been developed (Dutscke, 2005).

Clearly, CO_2 sequestration in soils is an issue that has not yet been fully explored and highlighted in the policy arena, although there is a clear need for this: "Agricultural soils are a net source of carbon dioxide - but they could be made into a net sink. As much as 400–800 million tons of carbon could be taken up by agricultural soils every year through improved management practices designed to increase agricultural productivity (UNDP, 1997, quoted in UNCCD, 2004). Among the strategies advocated are the use of low- or no-tillage practices, returning more crop residues to the soil; introducing perennial crops; and in temperate regions, increased use of animal manure.

Convention on Biological Diversity

The CBD addresses the land issue mainly through the ecosystem approach. Soil biodiversity is only beginning to be addressed by in-depth research, and a special work programme on soil biodiversity has been launched by the CBD (see contribution by Michael Stocking in this publication).

United Nations Convention to Combat Desertification

Of all the conventions, the UNCCD currently addresses soil issues most directly. However, it is not a global soil convention, since it aims to combat desertification and mitigate drought. It focuses on specific, albeit very large regions of the world. According to the UNCCD definition, desertification "means land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities". Nevertheless, UNCCD says: "Recognising the work that remains to be done in raising the profile of soil conservation, the Convention provides the structure and an enabling framework for affected countries to work with land management experts to develop sustainable land use practices to conserve topsoil" (UNCCD Secretariat, 2004). National Action Programmes are one of the key instruments in the implementation of the Convention, and these programmes address soil and land management issues. As of 2005,

Far left:
Efficient water use in the dry highland area of Wadi Dar, Yemen.
Photo by Hans Hurni

Left:
The Sahara has expanded by more than 10 percent in the last century. Sandstorm in Niger.
Photo by Hanspeter Liniger

77 National Action Programmes had been prepared and adopted. These instruments are considered core references in an ongoing process of planning for poverty reduction and the sustainable development of drylands (UNCCD Fact sheet 4, 2004). UNCCD highlights the need to integrate efforts to combat desertification into other development programme frameworks. Programmes are expected to outline long-term strategies, and are formulated with the participation of local communities. These aspects are essential to provide ownership and continuity for long-term programming.

UNCCD's Committee on Science and Technology (CST) serves as a subsidiary body of the Conference of the Parties (COP). Its role is the provision of information and advice on scientific and technological matters relating to combating desertification and mitigating the effects of drought. The CST is composed of government representatives competent in the fields of expertise relevant to combating desertification and mitigating the effects of drought. Since 2002, the Global Environmental Fund has served as the official financial mechanism for UNCCD. It has developed an operational programme (OP 15) on sustainable land management. Between 2002 and 2004, the GEF funded more than $72 million worth of projects focused primarily on combating deforestation and desertification. Obviously, the land degradation issue also cuts across the other focal areas of GEF, particularly biodiversity and climate change (see contribution by Anna Tengberg in this publication).

Synergies between the conventions

Synergies between the conventions should be built on the basis of the many obvious direct and indirect links between carbon capture in degraded lands, adding value to and enhancing biodiversity in ecosystems, sustainable management of soils, and efficient and sustainable use of energy from biomass and other non-fossil sources. The need for improved linkages and cooperation was identified several years ago (Herold et al., 2001). A joint liaison group for the three Rio Conventions was created in 2001, and a number of activities (workshops) have highlighted the potential for synergies between the conventions. UNEP has created a Division of Environmental Convention, with the mission of identifying synergies and promoting substantive collaboration among Multilateral Environmental Agreements. The establishment of the GEF as a financial mechanism for UNCCD makes it possible to develop more credible synergistic programmes that foster new partnerships between actors at different levels and from different sectors. Even if the role of sustainable land and soil management is not obvious in the formulation of the convention, is it nevertheless a basic condition for sustainable development, and a starting point from which synergies can be built among the conventions (Ott, 2005).

References

Dutscke, M., 2005: Methodological issues for the inclusion of organic agriculture under the Clean Development Mechanism. Presentation at side event of the Climate Conference in Montreal, November 28 to December 9, 2005. http://www.agroeco.nl/project.php?i=64

Herold, A., Eberle, U., Ploetz, Chr. and Scholz, S., 2001: Requirements of climate protection with regard to the quality of ecosystems: Use of synergies between the Framework Convention of Climate Change and the Convention on Biological Diversity. Federal Environmental Agency, Berlin.

Ott, C., 2005: Global Conventions and Environmental Governance. InfoResources Focus No. 3/ 2005. Zollikofen, Switzerland. Available at: http://www.inforesources.ch/

UNFCCC, 2004: Climate Change Information Sheet 27. Available at: http://unfccc.int/

UNCCD Secretariat, 2004. Preserving our common ground. UNCCD 10 years on. Secretariat of the United Nations Convention to Combat Desertification, Bonn, Germany. Available at: http://www.unccd.int/secretariat/secretariat.php

UNEP, 1997: Climate Change Information Kit. United Nations Environment Programme (UNEP), Information Unit for Conventions, Geneva.

Internet sites of the conventions
CBD: http://www.biodiv.org/
UNFCCC: http://unfccc.int/
UNCCD: http://www.unccd.int/